

OPTIMIZED DATA STREAMING AND USES THEREOF

ABSTRACT OF THE INVENTION

A variable-rate compressed multimedia data stream is typically characterized by relatively short intervals of relatively high local bitrate between relatively long intervals of relatively low bitrate. Typically, the perceived quality of the presentation at playback depends heavily on this data with locally high rate. However, it is this segment that is also most susceptible to stalls in bandwidth, and most limited by underflow constraints imposed by most current streaming techniques. This invention provides a novel simple solution to maximize use of all available bandwidth to pre-stream such data in an auxiliary channel while streaming the rest of the presentation along a main channel, called Tortoise and Hare Streaming. This method also realizes high robustness in the face of jittery bandwidths with minimal additional memory or computation resources at both the server and the client. Methods to decide which channel a given block of data should be allocated to for transmission are disclosed. Methods to determine a schedule for transmission in each channel based upon conditions such as network conditions, presentation quality are also disclosed. Finally, a complete architecture from authoring to playback for an embodiment of the system is provided.